AUTHOR INDEX

Agarwal, M., *see* Shukla, J.B. et al.
Ågren, G.I., *see* Gobran, G.R. and Ågren, G.I.
Bachelet, D. (Las Cruces, NM, U.S.A.), Hunt, H.W. and Detling, J.K. (Fort Collins, CO, U.S.A.)
A simulation model of intraseasonal carbon and nitrogen dynamics of blue grama swards as influenced by above- and belowground grazing 231
Bernardi, M. (Niamey, Niger), Mishoe, J.W. and Jones, J.W. (Gainesville, FL, U.S.A.)
RAGHUVA: a computer simulation of *Raghuva albipunctella* population dynamics, and *Pennisetum americanum* and *P. typhoides* phenology 275
Biondini, M.E., *see* Sala, O.E. et al.
Bowles, A., *see* Reed, M. et al.
Chelazzi, G., *see* Focardi, S. et al.
Coulson, R.N., *see* Saarenmaa, H. et al.
Dabrowski, K. (Olsztyn, Poland), Takashima, F. and Law, Y.K. (Tokyo, Japan)
Bioenergetic model for the analysis of the ontogenetical aspects of coregonid fish growth 195
Deneubourg, J.L., *see* Focardi, S. et al.
Detling, J.K., *see* Bachelet, D. et al.
Emlen, J.M. and Pikitch, E.K. (Seattle, WA, U.S.A.)
Animal population dynamics: Identification of critical components 253
Esser, G. (Osnabrück, Federal Republic of Germany)
Global land-use changes from 1860 to 1980 and future projections to 2500 307
Focardi, S. (Ozzano dell'Emilia, Italy), Deneubourg, J.L. (Bruxelles, Belgium) and Chelazzi, G. (Firenze, Italy)
Theoretical analysis of rhythmical clustering in an intertidal gastropod 177
Folse, L.J., *see* Saarenmaa, H. et al.
Freedman, H.I., *see* Shukla, J.B. et al.
Gard, T.C. (Athens, GA, U.S.A.)
Aggregation in stochastic ecosystem models 153
Gobran, G.R. and Ågren, G.I. (Uppsala, Sweden)
Significance of changes in K_c values for Ca–Al exchange and its effects on soil and water acidification predictions 165
Goffinet, B., *see* Wallach, D. and Goffinet, B.
Grant, W.E., *see* Saarenmaa, H. et al.
Gurtowski, M., *see* Plichta, W. and Gurtowski, M.
Hanson, J.D. (Fort Collins, CO, U.S.A.), Skiles, J.W. (San Diego, CA, U.S.A.) and Parton, W.J. (Fort Collins, CO, U.S.A.)
A multi-species model for rangeland plant communities 89
Hunt, H.W., *see* Bachelet, D. et al.
Jayko, K., *see* Reed, M. et al.
Jones, J.W., *see* Bernardi, M. et al.
Lafrance, P., *see* Padilla, F. et al.

Lauenroth, W.K., *see* Sala, O.E. et al.
Law, Y.K., *see* Dabrowski, K. et al.
Leatherwood, S., *see* Reed, M. et al.
Levine, S.H. (Medford, M.A., U.S.A.)
A dynamic formulation for input–output modelling of exploited ecosystems 143
Makela, M.E., *see* Saarenmaa, H. et al.
Mishoe, J.W., *see* Bernardi, M. et al.
Misra, O.P., *see* Shukla, J.B. et al.
Oderwald, R.G., *see* Somers, G.L. and Oderwald, R.G.
Packard, J.M., *see* Saarenmaa, H. et al.
Padilla, F., Lafrance, P., Robert, C. and Villeneuve, J.-P. (Ste-Foy, Que., Canada)
Modeling the transport and the fate of pesticides in the unsaturated zone considering temperature effects 73
Pal, V.N., *see* Shukla, J.B. et al.
Parton, W.J., *see* Hanson, J.D. et al.
Pikitch, E.K., *see* Emlen, J.M. and Pikitch, E.K.
Plichta, W. and Gurtowski, M. (Toruń, Poland)
A general analytical model of the process of humus mineralization and accumulation in soil 209
Reed, M., Jayko, K. (Narragansett, RI, U.S.A.), Bowles, A. and Leatherwood, S. (San Diego, CA, U.S.A.)
Numerical models of bowhead and gray whale migration in Alaskan waters 1
Robert, C., *see* Padilla, F. et al.
Saarenmaa, H. (Helsinki, Finland), Stone, N.D. Folse, L.J., Packard, J.M., Grant, W.E., Makela, M.E. and Coulson, R.N. (College Station, TX, U.S.A.)
An artificial intelligence modelling approach to simulating animal/habitat interactions 125
Sala, O.E. (Fort Collins, CO, U.S.A.), Biondini, M.E. (Fargo, ND, U.S.A.) and Lauenroth, W.K. (Fort Collins, CO, U.S.A.)
Bias in estimates of primary production: an analytical solution 43
Shukla, A., *see* Shukla, J.B. et al.
Shukla, J.B., Freedman, H.I. (Edmonton, Alta., Canada), Pal, V.N., Misra, O.P., Agarwal, M. and Shukla, A. (Kanpur, India)
Degradation and subsequent regeneration of a forestry resource: a mathematical model 219
Skiles, J.W., *see* Hanson, J.D. et al.
Somers, G.L. (Auburn, AL, U.S.A.) and Oderwald, R.G. (Blacksburg, VA, U.S.A.)
Estimating and constructing confidence intervals for spatial patterns between random and regular 57
Stone, N.D., *see* Saarenmaa, H. et al.
Takashima, F., *see* Dabrowski, K. et al.
Villeneuve, J.-P., *see* Padilla, F. et al.
Wallach, D. and Goffinet, B.(Castanet Tolosan, France)
Mean squared error of prediction as a criterion for evaluating and comparing system models 299

CONTENTS OF *ECOLOGICAL MODELLING*, VOL. 44

Vol. 44 NOS. 1/2 DECEMBER 1988

Numerical models of bowhead and gray whale migration in Alaskan waters
M. Reed, K. Jayko (Narragansett, RI, U.S.A.), A. Bowles and S. Leatherwood (San Diego, CA, U.S.A.) 1

Bias in estimates of primary production: an analytical solution
O.E. Sala (Fort Collins, CO, U.S.A.), M.E. Biondini (Fargo, ND, U.S.A.) and W.K. Lauenroth (Fort Collins, CO, U.S.A.) 43

Estimating and constructing confidence intervals for spatial patterns between random and regular
G.L. Somers (Auburn, AL, U.S.A.) and R.G. Oderwald (Blacksburg, VA, U.S.A.) .. 57

Modeling the transport and the fate of pesticides in the unsaturated zone considering temperature effects
F. Padilla, P. Lafrance, C. Robert and J.-P. Villeneuve (Ste-Foy, Que., Canada) ... 73

A multi-species model for rangeland plant communities
J.D. Hanson (Fort Collins, CO, U.S.A.), J.W. Skiles (San Diego, CA, U.S.A.) and W.J. Parton (Fort Collins, CO, U.S.A.) 89

An artificial intelligence modelling approach to simulating animal/habitat interactions
H. Saarenmaa (Helsinki, Finland), N.D. Stone, L.J. Folse, J.M. Packard, W.E. Grant, M.E. Makela and R.N. Coulson (College Station, TX, U.S.A.) 125

A dynamic formulation for input–output modelling of exploited ecosystems
S.H. Levine (Medford, MA, U.S.A.) 143

Aggregation in stochastic ecosystem models
T.C. Gard (Athens, GA, U.S.A.) 153

Vol. 44 NOS. 3/4 JANUARY 1989

Significance of changes in K_c values for Ca–Al exchange and its effects on soil and water acidification predictions
G.R. Gobran and G.I. Ågren (Uppsala, Sweden) 165

Theoretical analysis of rhythmical clustering in an intertidal gastropod
S. Focardi (Ozzano dell'Emilia, Italy), J.L. Deneubourg (Bruxelles, Belgium) and G. Chelazzi (Firenze, Italy) 177

Bioenergetic model for the analysis of the ontogenetical aspects of coregonid fish growth
K. Dabrowski (Olsztyn, Poland), F. Takashima and Y.K. Law (Tokyo, Japan) 195

A general analytical model of the process of humus mineralization and accumulation in soil
W. Plichta and M. Gurtowski (Toruń, Poland) 209

Degradation and subsequent regeneration of a forestry resource: a mathematical model
J.B. Shukla, H.I. Freedman (Edmonton, Alta., Canada), V.N. Pal, O.P. Misra, M. Agarwal and A. Shukla (Kanpur, India) 219

A simulation model of intraseasonal carbon and nitrogen dynamics of blue grama swards as influenced by above- and belowground grazing
D. Bachelet (Las Cruces, NM, U.S.A.), H.W. Hunt and J.K. Detling (Fort Collins, CO, U.S.A.) 231
Animal population dynamics: Identification of critical components
J.M. Emlen and E.K. Pikitch (Seattle, WA, U.S.A.) 253
RAGHUVA: a computer simulation of *Raghuva albipunctella* population dynamics, and *Pennisetum americanum* and *P. typhoides* phenology
M. Bernardi (Niamey, Niger), J.W. Mishoe and J.W. Jones (Gainesville, FL, U.S.A.) 275
Mean squared error of prediction as a criterion for evaluating and comparing system models
D. Wallach and B. Goffinet (Castanet Tolosan, France) 299
Global land-use changes from 1860 to 1980 and future projections to 2500
G. Esser (Osnabrück, Federal Republic of Germany) 307

Author Index 317